REMARKS

Status of the Claims

Pending claims

Claims 1, 2, 4 to 9, 14 to 16, 18 to 20, 22 to 32 and 34 to 59 are pending.

Claims canceled and added in the instant amendment

Claims 28, 30 and 34, claims 40 to 43, and 56 to 59, are canceled without prejudice or disclaimer; and new claims 60 to 74, are added. Thus, after entry of the instant amendment claims 1, 2, 4 to 9, 14 to 16, 18 to 20, 22 to 27, 29, 31, 32, 35 to 39, 44 to 55, and 60 to 74, will be pending and under consideration.

Outstanding Rejections

Claims 1, 2, 4 to 9, 14 to 16, 18 to 20, 22 to 32 and 34 to 59 under 35 U.S.C. §112, first paragraph, for allegedly containing "new matter". Claims 1, 2, 4 to 9, 14 to 16, 18 to 20, 22 to 32 and 34 to 59, are rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the enablement requirement of 35 U.S.C. §112, first paragraph. Claims 27 to 30 and 56 to 59, are rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement of section 112, first paragraph.

Applicants respectfully traverse all outstanding objections to the specification and rejection of the claims.

Support for the claim amendments

The specification sets forth an extensive description of the invention in the new and amended claims. For example, support for claims drawn to enzymatically active fragments of enzymes of the invention can be found, inter alia, in the second paragraph of page 3, of WO 97/44361 (the publication of PCT/US97/08793). Accordingly, no new matter has been added by the instant amendments.

Applicants respectfully request entry of the amendments set forth in this response under 37 CFR §1.116. The amendment places the case in condition for allowance and places the case in better condition for appeal; the amendment does not raise any issues of new matter; and, the amended claims do not present new issues requiring further consideration or search.

Drawings

Applicants thank the Examiner for noting that a color attachment was filed with Applicants' response of October 13, 2005 (please see page 2 of the OA). Attached herein is petition to accept a color drawing for the file history under 37 CFR 1.84(a)(2), with the requisite fee under 37 CFR 1.17(h). Applicants note that this is not a specification drawing, but rather is a color attachment for a response to a non-final office action.

Issues under 35 U.S.C. §112, first paragraph, new matter

Claims 1, 2, 4 to 9, 14 to 16, 18 to 20, 22 to 32 and 34 to 59 under 35 U.S.C. §112, first paragraph, for allegedly containing "new matter". In particular, the Office alleges there is no support in the specification for the term "synthetic" with respect to the claimed nucleic acids or polypeptides of this invention (please see page 3 of the OA).

However, Applicants respectfully submit that the specification enables and describes embodiments comprising synthetic polynucleotides and polypeptides; please see, inter alia, page 6, third full paragraph, of WO 97/44361 (this application is a national phase of PCT/US97/08793):

> "Recombinant" enzymes refer to enzymes produced by recombinant DNA techniques; i.e., produced from cells transformed by an exogenous DNA construct encoding the desired enzyme. "Synthetic" enzymes are those prepared by chemical synthesis. [emphasis added]

See also, inter alia, the paragraph spanning pages 8 to 9, of WO 97/44361:

> The endoglucanase polypeptides of the invention can be obtained using any of several standard methods. For example, endoglucanase polypeptides can be produced in a standard recombinant expression systems (see below), chemically synthesized (this approach may be limited to small endoglucanase peptide fragments), or purified from organisms in which they are naturally expressed.

See also, inter alia, page 9, third full paragraph, of WO 97/44361:

> The polynucleotide of the present invention may be in the form of DNA which DNA includes cDNA, genomic DNA, and synthetic DNA. The DNA may be double-stranded or single-stranded, and if single stranded may be the coding strand or non-coding (anti-sense) strand. The coding sequence which encodes the mature enzyme may be identical to the coding sequences shown in Figure 1 and/or that of the deposited clone (SEQ IDNO:1), or may be a different coding sequence which coding sequence, as a result of the redundancy or degeneracy of the genetic code, encodes the same mature enzyme as the DNA of Figure 1 (e.g., SEQ ID NO:1). [emphasis added]

See also, inter alia, the first full paragraph of page 21, of WO 97/44361:

> The enzyme of the present invention may be a recombinant enzyme, a natural enzyme or a synthetic enzyme, preferably a recombinant enzyme. [emphasis added]

See also, inter alia, the fourth paragraph of page 23, of WO 97/44361:

> The polynucleotides of the present invention may be employed for producing enzymes by recombinant techniques. Thus, for example, the polynucleotide may be included in any one of a variety of expression vectors for expressing an enzyme. Such vectors include chromosomal, nonchromosomal and synthetic DNA sequences, e.g., derivatives of SV40; bacterial plasmids; phage DNA; baculovirus; yeast plasmids; vectors derived from combinations of plasmids and phage DNA, viral DNA such as vaccinia, adenovirus, fowl pox virus, and pseudorabies. However, any other vector may be used as long as it is replicable and viable in the host. [emphasis added]

See also, inter alia, the third full paragraph of page 25, of WO 97/44361:

> The constructs in host cells can be used in a conventional manner to produce the gene product encoded by the recombinant sequence. Alternatively, the enzymes of the invention can be synthetically produced by conventional peptide synthesizers. [emphasis added]

See also, inter alia, the second paragraph of page 28, of WO 97/44361:

> The enzymes of the present invention may be a naturally purified product, or a product of chemical synthetic procedures, or produced by recombinant techniques from a prokaryotic or eukaryotic host (for example, by bacterial, yeast, higher plant, insect and mammalian cells in culture). Depending upon the host employed in a recombinant production procedure, the enzymes of the present invention may be glycosylated or may be non-glycosylated. Enzymes of the invention may or may not also include an initial methionine amino acid residue. [emphasis added]

See also, inter alia, the second full paragraph of page 34, of WO 97/44361:

> "Oligonucleotides" refers to either a single stranded polydeoxynucleotide or two complementary polydeoxynucleotide strands which may be chemically synthesized. Such synthetic oligonucleotides may or may not have a 5' phosphate. Those that do not will not ligate to another oligonucleotide without adding a phosphate with an ATP in the presence of a kinase. A synthetic oligonucleotide will ligate to a fragment that has not been dephosphorylated. [emphasis added]

Issues under 35 U.S.C. §112, first paragraph, enablement requirement

Claims 1, 2, 4 to 9, 14 to 16, 18 to 20, 22 to 32 and 34 to 59, are rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the enablement requirement of section 112, first paragraph (please see pages 3 to 9 of the OA).

The Office did state that the specification does enable an endoglucanase having the amino acid sequence of SEQ ID NO:46, or at least 95% sequence identity to SEQ ID NO:46 and having

endoglucanase activity (see lines 2 to 4, of the second paragraph, of page 3, of the OA). Accordingly, please see: amended claim 1, and claims 49 to 52 and 55, now drawn to polypeptides having endoglucanase or cellulase activity having an amino acid sequence having at least 95% sequence identity to the amino acid sequence of SEQ ID NO:46, or encoded by nucleic acids having at least 95% sequence identity to the polynucleotide sequence of SEQ ID NO:45, and compositions comprising these enzymes; claims 2 and 4, drawn to nucleic acids encoding these polypeptides; claims 5 to 7, drawn to vectors comprising these nucleic acids; claims 8 and 9, drawn to host cells comprising these nucleic acids or vectors; claim 14 and 45 to 48, drawn to methods for using these nucleic acids and enzymes; claim 18, drawn to a polypeptides having endoglucanase activity, wherein the sequence identity is at least 97%; claim 20, wherein the nucleic acid has the polynucleotide sequence of SEQ ID NO:45; claim 22, wherein the polypeptide has at least 97% sequence identity to the amino acid sequence of SEQ ID NO:46; claim 24, wherein the polypeptide has endoglucanase activity; claim 25, wherein the polypeptide has cellulase activity; claim 26, wherein the cellulase activity comprises a carboxymethyl cellulase activity; claim 44, drawn to methods for converting plant biomass into fuels and chemicals using enzymes of amended claim 1.

However, the Office alleged that the specification does not reasonably enable any of the several claimed genera of polypeptides or polynucleotides having at least 90% sequence identity to an exemplary sequence of the invention (SEQ ID NO:45/46), or the claimed subsequences thereof, e.g., polypeptides at least 30 or 50 amino acid residues.

Applicants respectfully maintain that the specification enabled the skilled artisan at the time of the invention to identify, and make and use, any of the several claimed genus of polypeptides or polynucleotides having at least 90% sequence identity to SEQ ID NO:45/46, and to active fragments thereof – and in support have provided argument, evidence and expert declaration in previous responses, all of which are expressly incorporated herein (see, e.g., pages 12 to 17, of the June 26, 2006, response; and pages 10 to 16, of the October 13, 2005, response).

To address the Office's concerns, Applicants have amended claims to limit the scope of the claimed genus of polypeptides, e.g., claim 1 is amended in this response to 95% sequence identity, down from 90% sequence identity; also, claims directed to polypeptides at least 30 or 50 amino acid residues of the claimed enzymes are canceled in this amendment.

In light of the instant amendment, and because the specification provided direction and guidance on how to practice the claimed invention and all of the methods needed to practice the invention were well known, and because there was a high level of skill in the art at the time the application was filed, the instant specification did provide reasonable enablement commensurate with the scope of the claimed invention. Accordingly, the enablement rejection under section 112, first paragraph, can be properly withdrawn.

Issues under 35 U.S.C. §112, first paragraph, written description requirement

Claims 27 to 30 and 56 to 59, are rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement of section 112, first paragraph.

Applicants respectfully maintain that the claimed invention is sufficiently described in the specification so that one of ordinary skill in the art would be able to ascertain the scope of the claims with reasonable clarity and recognize that Applicants' were in possession of the claimed invention at the time of filing, and in previous responses, all of which are expressly incorporated herein (see, e.g., pages 17 to 19, of the June 26, 2006, response; and pages 16 to 19, of their October 13, 2005, response) have provided argument in support.

The Office remains concerned that the claimed invention encompasses a "large variable genus" (see, e.g., page 12, line 17, of the OA).

To address the Office's concerns, Applicants have amended claims to limit the scope of the claimed genus of polypeptides, e.g., claim 1 is amended in this response to 95% sequence identity, down from 90% sequence identity; also, claims directed to polypeptides at least 30 or 50 amino acid residues of the claimed enzymes are canceled in this amendment.

Accordingly, Applicants respectfully submit that the pending claims as amended meet the written description requirement under 35 U.S.C. §112, first paragraph.

CONCLUSION

Applicants have respectfully requested entry of the amendment set forth in this response under 37 CFR §1.116, because this amendment places the case in condition for allowance and places the case in better condition for appeal; the amendment does not raise any issues of new matter; and, the amended claims do not present new issues requiring further consideration or search.

In view of the foregoing amendment and remarks, Applicants respectfully aver that the Examiner can properly withdraw the rejection of the pending claims under 35 U.S.C. §112, first paragraph. In view of the above, claims in this application after entry of the instant amendment are believed to be in condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejections of the claims and to pass this application to issue.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 564462000502. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

After the Examiner has reviewed this after final response and amendment, if the Examiner believes a telephonic interview would help expedite prosecution, please call Applicants' representative at (858) 720-5133.

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Respectfully submitted,

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